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Crush Scepticism and Mistrust

OUR METHOD

Untiring Use of a Battering Ram
of Fair Dealing

Directions for operating the

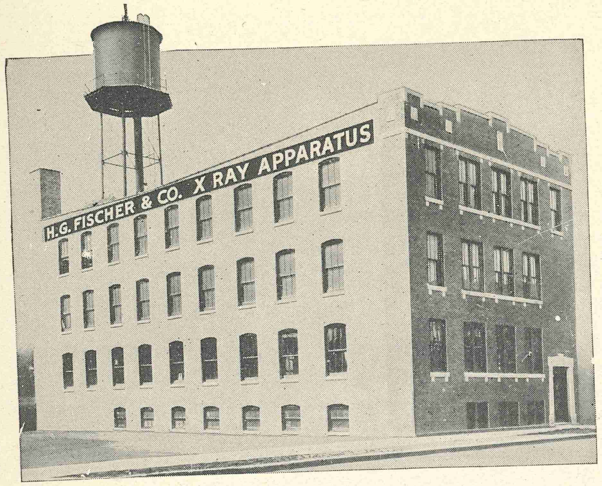
FISCHER TYPE "H5"

X-Ray and High Frequency Outfit

Manufactured by

H. G. FISCHER & CO.

Physician's and Dentist's
Electrical Equipment



Home of H. G. Fischer & Co.

PREAMBLE

The contents of this small booklet were intended to assist the Dentist in obtaining the best possible results from our Type "H5" Equipment.

We make no attempt at delving into deep scientific theories regarding the X-Ray and High Frequency currents, it being intended for the Practical worker only.

These instructions were carefully compiled for the Type "H5" generator, and, as extreme care was exercised in simplifying, you should be able to derive excellent results by observing them as written.

Many steps in the following technic may be eliminated after the operator becomes thoroughly acquainted with his equipment.

Directions for properly operating the Type "H5" X-Ray and High Frequency Outfit

Carefully unpack boxes and check each item on the enclosed sheet. Report any shortages at once if not checked on packing list and same will receive prompt attention. In case of damages to parts, due to careless handling by the transportation companies, please have their representative go over the outfit with you, to enable us to put in proper claim.

Select a space for your Cabinet near an electric current outlet of from 104 to 120 Volts, 60 Cycle Alternating Current, and capable of carrying 15 Amperes. Don't connect to a chandelier or other like fixture if possible to obtain current otherwise. The wires used in the ordinary fixture are generally too small to deliver the full energy to the machine, and the outfit will produce better results if connected to a wall bracket or switch; i. e., some direct connection to a size 12 or 14 wire. Information on this subject can be had from your local electric station.

See Diagram Number 26

Open switch "A". Connect ends of heavy connecting cord to plug to fit lamp socket, or knife switch. Most any outlet leading from a No. 14 wire or larger, will suffice. (See above.)

Set rubber posts "H" and "G" in cavities in marble plate on top of cabinet. The slide rod "F" should be inserted with the rubber handle toward control board, for easy access to operator when handling switches.

For High Frequency Treatments

Set lever "K" on point 1.

Set lever "C" on point 1.

Close interrupter points "D" by turning screw "E" gently to right. Connect heavy black insulated cord, which is fastened to the hard Rubber Handle, to either post "H" or "G".

Slip the desired electrode into the end of the rubber handle.

Close switch "A" forward, and slowly open spark points "D" until you get a smooth flow of violet light in the tube. A very small turn only is necessary.

To increase length of spark from electrode, open switch "A" and set lever "C" on point 2, and repeat as above. Should you desire a sharper current, set lever "K" on point 2. Always be sure to test current on yourself before applying same to patient.

Lever "K" controls the Frequency (or Oscillations) of the current; point 1 being the highest, and best suited for treatment work. Point 2 is approximately half the frequency of point 1, and so on to point 4, which is the lowest rate of oscillations, but best suited for X-Ray work.

Lever "C" is the Rheostat, and controls the volume of current entering the coil; point 1 being lowest, and point 6 full power.

To clean spark points "D" wet with Saliva a corner of a card and slide between points. Then burn off the moisture with current by closing switch "A". (Have **No** electrode or X-Ray Tube in the circuit when cleaning points.) Repeat the cleaning process two or three times, and you will find a considerable quantity of carbon adhering to the card. You will note a very fine control of High Frequency currents after cleaning in this manner.

Be sure to **open** switch "A" when through using the cabinet.

DON'TS

DO NOT touch the metal parts of your cord or handle when in use.

DO NOT make or break connection with active poles "H" or "G" on machine without first cutting off current at switch "A".

DO NOT imagine that closing the spark points "D" cuts off the current. Doing so will stop all current discharge as far as can be seen, but will confine the energy to the Transformer, and is apt to do considerable harm if left on for any length of time.

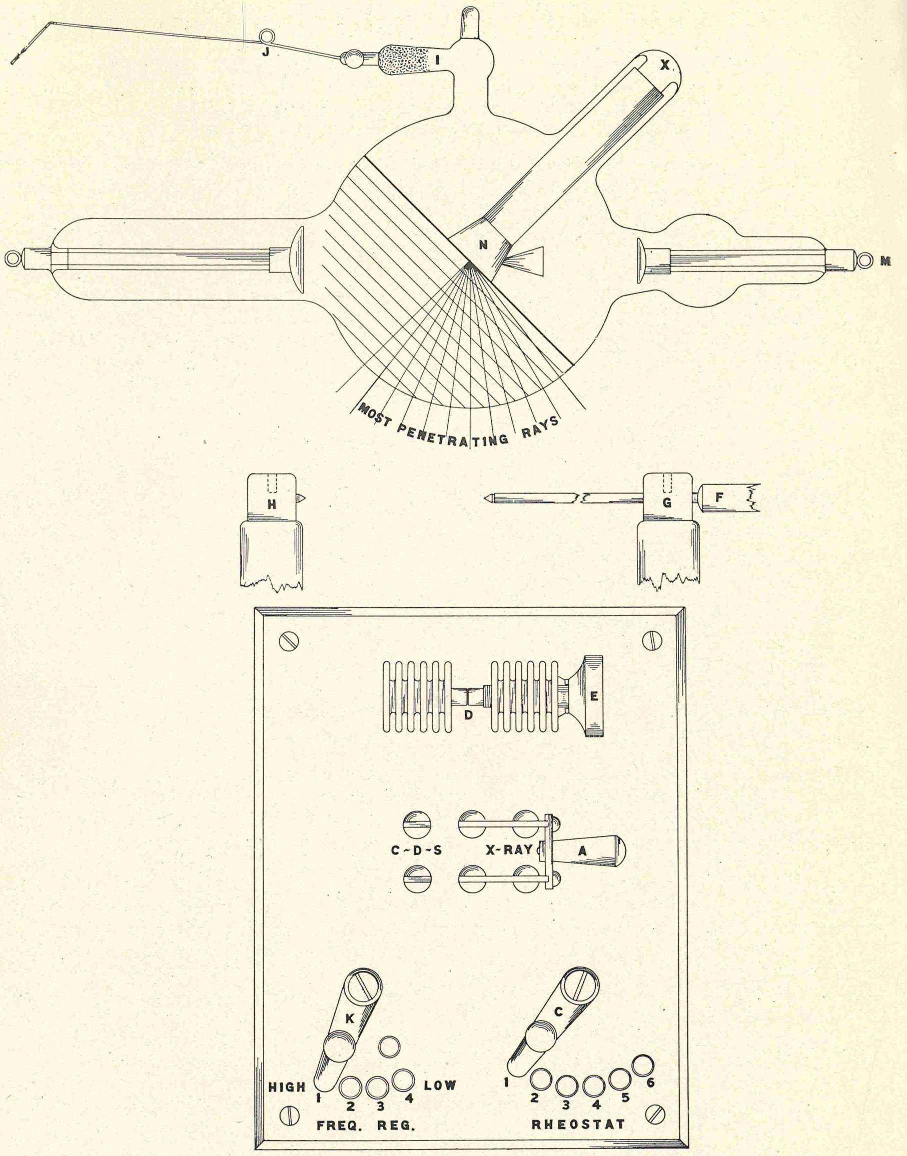


Diagram No. 26

“A”—Main Switch.
“C”—Rheostat Lever.
“D”—Interrupter Points.
“E”—Knob for adjusting Interrupter Points.
“F”—Slide Rod.
“G” & “H”—High Tension Terminals.
“I”—Regulating Chamber.
“J”—Regulating Adjuster.
“K”—Frequency Regulator.
“L”—Cathode Terminal.
“M”—Assistant Cathode Terminal.
“N”—Anode.
“X”—End of Anode, NOT used for connection.

What Are High Frequency Currents?

This Question is made clear in a graphical way by comparison with water

In our demonstration we will assume that the voltage will be the water pressure at the hydrant. When we increase the pressure we increase the amount of water we can draw due to the speed with which the water flows.

The voltage obtained from Type “H” coil is 150,000 volts or approximately 1,500 times the voltage of the average electric lamp used. If you were to touch both terminals of a lamp socket you would receive a severe muscular shock, though the voltage of the current would be only 1-1500 of what you would receive from type “H” coil.

Let us see what 1,500 times the pressure of the water at the hydrant would mean. Upon opening the faucet a stream of water would travel at such speed that anything brought into contact with it would be struck as with a blow from a sword.

This same condition would prevail if electrical currents of 150,000 volts were permitted to enter the human body. It would be as a sword thrust that would cleave from head to heel.

Now let us take this tremendous pressure and force water through an atomizer with hundreds of thousands of tiny holes. The result would be a mist of spray, that would penetrate the entire surrounding atmosphere. The most delicate of flowers would be refreshed and could thrive when treated in conditions produced in this manner.

In the generation of High Frequency currents, an electrical condenser is connected in the circuit, acting as does the atomizer in separating the flow into minute impulses of such rapid succession that no sensation effects the nervous centers. Likewise there is no muscular contraction.

The human nervous system can detect oscillations in an electrical current up to 10,000 per second, and as the frequency increases, the sensation decreases. Type “H” has a frequency of over **one-half million** per second.

The operator therefore has at his command a tremendously powerful agent, from which more benefit can be derived in a few seconds’ treatment than with hours of the one time popular battery outfit.

There is no quackery or uncertainty about it, and it is not put forward as a “cure-all;” but, being a thorough cell massage and peculiarly healthy stimulant, its intelligent use is a wonderful aid in restoring the normal equilibrium wherever it has been disturbed and the physical condition impaired from almost any cause, and used as directed with ordinary discretion, its results are almost universally beneficial and never harmful.

Any dentist once initiated into the results obtained from the use of High Frequency, high potential violet ray currents such as generated by type “H,” finds their use absolutely indispensable.

The term High Potential is merely indicative of high pressure or voltage, the same running in various treatment machines as high as from 10,000 to 150,000 volts.

General Use of High Frequency Currents

High Frequency Currents, (the Violet Ray), are coming daily into more frequent use by dentists, and are meeting with almost universal favor. They are used to advantage in cases of Pyorrhea, Devitalizing teeth, drying Cavities, sterilizing Root Canals, Bleaching, Abscesses, locating Devitalized Teeth, and for the relief of pain.

High Frequency Currents are Antiseptic, Sedative, Painless and Stimulating. Will alleviate swollen conditions, and in the treatment of Pyorrhea are almost indispensible. The current has a soothing, anesthetizing effect, which in some cases is sufficient for the lancing of abscesses, or even for the removal of roots. The small cupped electrode is used for this purpose; the cup supporting a small bit of absorbant cotton, generally saturated with Iodine, or a weak solution of Argyrol.

High Frequency Currents will produce a Hyperemic condition at most any time or place; the effect on loosened teeth and on receding, faded gums being most marvelous, the teeth tightening in their sockets, and the gums taking on their former natural healthy color.

For testing devitalized teeth, this current is almost infallible. Adjust the spark points to deliver the minimum amount of current to the Pointed Electrode, and merely tap the suspected tooth. A fairly sharp twinge will be felt if the tooth is vital, while there will be no sensation if the pulp is dead.

In cases of impacted teeth; treatment after extractions; toothache, and in case of pain from most any source the High Frequency Currents will bring decided relief.

For X-Ray Work

Set lever "K" on point 4.

Set lever "C" on point 1.

Close interrupter points "D" as for High Frequency. Throw in switch "A" forward, and gradually open points "D" until you get a continuous flow of thin sparks between poles "H" and "G". The wider the space at "D", the lower will be the frequency and the heavier the flow of current. A limit, however, is reached which is described in the following paragraphs. At this point it is well to remember that a very **High** Frequency Current, while best suited for treatment purposes, is almost useless for X-Ray work, owing to the oscillations being far too rapid. As these impulses are slowed down the power of penetration increases.

Now turn off the current, and connect cords from cord reels on posts "H" and "G" to ends of tube marked "L" and "M". The current output is Alternating and therefore Bi-Polar, and the tube will operate equally well with "H" connected to "L" and "G" to "M", or "H" to "M" and "G" to "L". However, it is always advisable to have the most active Rays turned from the operator, and the tube should be used with connections made between "H" and "L", and "G" and "M", as shown on diagram No. 26.

Close switch "A", and gradually open points "D" until you get a steady green glow in the tube. If tube is operating properly, the half directly in front of the target will light up with an apple green color, while the back half remains considerably darker. To see this best stand directly at side of tube and look through. A distinct hemisphere must be apparant; the more pronounced the better will be your results.

If the tube lights up properly, open switch "A" and set lever "C" on point 2 or 3. Try again, and if tube takes the current smoothly you are now ready to make your fluoroscopic examination or radiograph. When making these tests, watch the adjustment of points "D"; having them too wide apart will cause an unsteady flicker in the tube; too close will produce a choking effect. (More on this subject farther on.)

To determine just how much Penetration your tube has, set the slide rod "F" at different distances from pole "H". A **High** vacuum tube, (one of high penetration), will back up 6½ inches of spark between "H" and "G"; a **Medium** vacuum tube, of medium penetration, 5½ inches; while a comparatively **Low** vacuum tube will not back up more than three or four inches.

The reason for the above is the fact that the internal resistance of a High vacuum tube is very great; and the energy from the machine, instead of passing through and producing X-Rays, will jump the less resisting air gap between the terminals "H" and "G". The more gas you allow into the tube, the less the internal resistance; the tube absorbs more of the current, and leaves less to leak off at the terminals.

A **Hard** tube produces Less X-Rays, but of very penetrating qualities; suitable for heavy work.

A **Medium** tube produces more X-Rays than a hard tube, but of less penetration, and is best suited for medium radiographic work, such as Dental Film exposures, Lateral Skull, Knee, Shoulder, etc.

A **Soft** tube, of Low vacuum, produces a large quantity of X-Rays, but of very slight penetration. While this tube would make excellent radiographs of the Hand, Elbow, or Foot, it should never be used for medium or heavy work.

Should your tube fail to glow properly, or sparks jump the full gap from "H" to "G" in making these tests, the Vacuum in the tube is **too high,** and should be reduced. To remedy this, open switch "A"; set lever "K" on point 4 and "C" on point 1. Bring down the small wire "J" leading from the chamber "I", (see diagram) to about one-half inch from cathode terminal "L".

This chamber is filled with asbestos, treated with chemicals which vaporize when warmed by the passage of the current, which in turn reduces the Electrical Resistance. Adjust points "D" until nearly closed; snap in switch "A" once or twice, not more than a second of two; sparking can plainly be seen in the regulating chamber when the tube is being reduced. If no sparking appears, the reducer is not operating properly, due to lack of enough current. To remedy this, advance the rheostat lever "C" or open the spark points "D" a trifle more. Then raise wire "J" up at least five inches and try tube again as before. If you still do not obtain the desired hemisphere, repeat the reducing process. If no sparks jump across from cathode end "L" to wire "J", when attempting to reduce tube, either open points "D" a trifle more, or set lever "C" on point 2.

It is well not to over do this, as you can repeat the operation any number of times, whereas, if you allow too much gas into the tube, your only recourse is to send it back for re-exhaustion. Some reducers are more "lively" than others, and will affect the vacuum with only a slight touch. Others need a heavier current to accomplish the desired result. Therefore **watch** the regulating chamber and know your tube before going too far.

Very often tubes are considered too High in vacuum by the novice, and over-reduced, when the real trouble has been too great an opening at points "D". These points should be adjusted so that when the tube is disconnected an even steady spark passes from "H" to "G", and when tube is in the circuit it illuminates with no spasmodic, flickering lights, but with a steady glow.

You may easily determine this for yourself by trying a few times both with and without the tube. The best working point, for average X-Ray work, should be obtained by closing "D" entirely, and then opening about one-eighth turn of screw "E".

If there is any X-Ray treatment work to be done, we recommend setting lever "C" on point 1 or 2, and lever "K" on point 3 or 4. For Radiagraphic work have lever "K" on 4, and lever "C" on 5 or 6.

For Fluoroscopic and Radiographic work, a little judgment must be used as to the density of the object to be penetrated.

A stout patient is not necessarily hard to radiograph; a muscular patient will be found considerably more difficult. A good point to remember here is this: You can almost always gauge the opaqueness (to the X-Ray) of any object, by its specific gravity. Another thing is; Radiography is Shadow Work, and you cannot get a good outline of a part unless it differs in Density from surrounding tissues.

Dental X-Ray Exposures

Owing to the fact that so many factors enter into the determination of the proper lengths of exposures, the following schedule is only approximate. It is based on an average patient, and with lever "K" on point 4 and "C" on 6, and using Fast Films.

Lower Molars	Male	4 seconds
" Bicuspids	"	3 "
" Centrals	"	2 "
" Molars	Female	3 "
" Bicuspids	"	2 "
" Centrals	"	2 "
Upper Molars	Male	5 "
" Bicuspids	"	4 "
" Centrals	"	3 "
" Molars	Female	4 "
" Bicuspids	"	3 "
" Centrals	"	2 "

X-Ray Exposures other than Dental

For those operators who have some Body work to do, which does not come under the heading of "Dental" Radiography, but which is just as important nevertheless, we have prepared the following chart; based on a medium weight patient, using Paragon Plates.

Hand	5½" Spark Gap	2 Seconds
Wrist—Lateral	" " "	4 "
Wrist—Ant. Post	" " "	3 "
Elbow	" " "	5 "
Foot—Lateral	" " "	5 "
Foot—Ant. Post	" " "	5 "
Ankle	" " "	5 "
Upper Arm	" " "	5 "
Knee	" " "	9 "
Shoulder	6 " " "	11 "
Head—Lateral	" " "	15 "
Head—Ant. Post	" " "	35 "
Hip	" " "	30 "
Chest	" " "	15 "
Spine	" " "	30 "

For patients weighing over 150 pounds, use longer exposures accordingly. For smaller patients shorten time.

With lever "C" on point 5, add fifty per cent to exposure.

With lever "C" on point 4, double the time.

With slightly longer exposures than are called for above, a softer, lower vacuum tube will produce beautiful results.

When using the full power of the cabinet, it is not advisable to run the tube over five seconds at a time. Should you wish to make a Radiograph of a head, and the exposure chart calls for thirty-five seconds, break up the exposure into five sections of five seconds each, allowing at least five seconds between each. The reason for the above lies in the fact that the passing of the intense current heats up the tube; the heat tends to reduce the vacuum, and also the power of penetration.

You will be able to make a better negative in fifteen seconds by keeping the tube temperature down, than in thirty or more seconds by allowing it to get overheated.

The time of exposure will vary with the distance of the tube from the film or plate, greater exposures being necessary as the distance increases; the thickness of the part; transparency of the object; and the vacuum of the tube and its consequent penetration.

As the intensity of the X-Ray varies inversely with the square of the distance between the tube and the plate, the tube should not be too far away; otherwise the exposure will have to be lengthened considerably. As an example: If it takes an exposure of four seconds to make a perfect radiograph of a lower male molar, with the anode of your tube twelve inches from the film, it will mean an exposure of sixteen seconds if that distance is but doubled. On the other hand, setting the tube too close to the film or plate tends to enlarge and distort the image.

The age of the patient should also be taken into consideration, as a softer, lower vacuum tube will give best results with children, where the contrast between the bony structures and tissues is great. With aged patients, it will be harder to show bone detail, owing to the bones and tissues passing an almost equal amount of ray.

Make your exposures as short as practicable, as long exposures tend to produce an effect in some plates and films whereby they will not develop out clear; due to chemical changes in the silver salt in the emulsion.

The most penetrating X-Rays are those proceeding from the center of target (anode) at right angles to a line drawn from end to end of the tube and forty-five degrees from the face of the target. Consequently it is best to place the tube with the center of the target on the anode directly over the center of the part to be radiographed.

Before placing the film or plate in position, be sure the tube is tested to work properly at the desired sitting.

The operator should first place the patient in a light straight backed chair, without arms, and without head rest, unless you are using one specially designed for the work, as others have a tendency to complicate positions.

Next adjust the tube stand, and focus in an approximate position with the patient always in an upright "at attention" position. Then try the tube and regulate if necessary. (For ordinary Dental Radiography adjust your tube to back up about 5½" of spark gap.) Now get the film out of the lead lined chest and place in the patient's mouth at the correct angle (see illustration) and let the patient steady the head by resting the face lightly against the lead glass cone. There is sufficient Lead in this cone to prevent the X-Rays from spreading, and enough Glass to act as a perfect insulator. The X-Rays pass only through the opening.

The operator is then ready to make the exposure; using a watch to insure accurate timing, at least until you become proficient in the work.

A little movement of the entire head does not necessarily mean a spoiled negative, as the film, if held firmly in the mouth, will keep its position against the teeth; but should the patient allow the film to move, another exposure will be necessary.

In getting a focus be sure the Center of the target (anode) of the tube is directly over the center of the lead glass cone.

Place the film in the mouth with the smooth side towards the tube. For a radiograph of any upper teeth the patient should hold the film with the ball of the thumb only. For the lowers, the index finger only should be used to hold the film.

When making an exposure of upper teeth the head of the patient should in every case be in an upright position, the features parallel to a vertical line. If the head of the tube stand is then turned back until the angular cut surface of the lead glass cone is parallel to the face of the patient and the top edge of the cone is on an even line with the eyebrow, it will be found that the center of the cone is then properly placed to take in the apical area without distortion, and it only remains to place the film behind the tooth to be rayed.

For all lowers, tilt the entire tube support back until the rays are focused in a horizontal line, at right angles to the teeth. The patient can then rest the jaw right in the hollow of the cone.

Do not start out as a Speed Maniac. First learn to make good radiographs; then speed up if necessary. Always bear in mind that a New tube must be treated with considerable more care than a seasoned one, as it is what is commonly called Green and Untrained. With proper use, that is, care taken not to overheat or over-reduce, your tube should be better at the end of a year than when new.

It is advisable to have two tubes on hand, of different degrees of vacuum, for different classes of work. Your tubes will last longer when used alternately, and give better results; and should any accident befall one you always have another on hand for the emergency case.

The ordinary Dental Films are packed two in a packet; the emulsion coated sides facing the smooth side of the outer wrapper. This outer covering of Oiled paper will resist saliva, and protects the inner black light-proof wrapper and films.

These Films come in three popular sizes:

No. 1	—measuring	1⅜"x1⅝"
No. 1A—	"	1⅝"x2¼"
No. 2 —	"	2¼"x3 "

The No. 1 small size are suitable for all ordinary Dental Roentgenographs.

The No. 1A size is to be used when larger areas are to be covered, as for instance, in making a roentgen diagnosis of the entire mouth. It requires ten exposures on the No. 1 films to accomplish this, while it can be done with eight when using some of the No. 1A.

The No. 2 film is to be used when the desired position and result are impossible with either of the smaller sizes. These large films make excellent negatives of the upper or lower centrals, where it it often difficult to insert the small films behind the teeth in the usual way. Place the film straight (horizontally) back in the mouth. The tube is then raised slightly so that the rays are focused to the desired angle to insure the proper length of shadow.

We advocate the use of the No. 2 film in cases where necrotic areas extend away beyond the apices of the teeth; in which cases the large film is quite requisite to make a complete picture for diagnosis.

There are **two** distinct kinds of Eastman Dental Films; the Fast, packed in a Black Labeled box, and the Slow, always put up in boxes with Red Labels. We recommend the Fast because they require shorter exposures for the same work, as compared with the Slow. They both come in the same sizes, and are priced the same. The Slow Films, however, are preferred by many, as they give a rich clear Black and White Radiograph. They require at least three times the exposure of the Fast variety.

Ilford Films are very Fast; about four times the speed of the Slow Films. They finish up in the same manner as the Slow Films, showing a wealth of detail.

Very often the desired result cannot be obtained with either size of Film, and the X-Ray Plate must be resorted to. These plates come in several sizes, from the 5"x7" to 14"x17". For all dental purposes, however, the 5"x7" and 8"x10" sizes will be found ample.

Plates are most often used in cases of suspected fractures of both the superior and inferior maxillary bones; locating foreign bodies in the antrum (broken broaches and even teeth); for badly impacted third molars, where films are impractical; and for locating Osteoma, Cysts and Tumors of the mandible.

The following illustrations show the positions of tube and patient for all plate work.

In selecting a method of procedure for making radiographs, especially of children, the patient's comfort must be taken into consideration, and with this idea in mind, you will find it an advantage to use the extra-oral or plate method quite freely. The wisdom of this course will be apparant to anyone who has experienced the discomfort of having films placed lingually to the lower teeth, where the tissues are very sensitive, or who has had them placed back in the molar region, against the palate, where they so frequently induce gagging. These unpleasant features are all eliminated by using the plate method.

The Sign Fischer CHICAGO, ILL. **of Service**

Technic of Making Radiographs. Positions.

Always bear in mind, that Radiography is Shadow Work, and that Angles have a most important bearing on Results. Far too often the X-Ray Tube is tilted too high, or allowed to drop too low, with the result that the images on the negatives are distorted; some lengthened, and some shortened. If you will study the Figures Nos. 1 to 8, you will notice that in order to produce a result on which the images are neither lengthened nor shortened, the Rays must strike the film at nearly (but not quite) a right angle. The following are illustrations of Uppers.

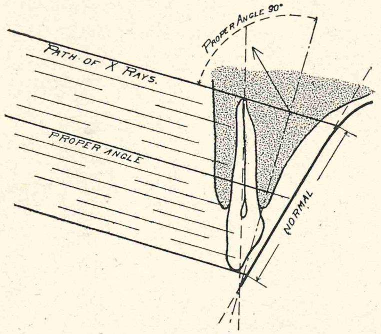

PROPER ANGLE 90°
PATH OF X RAYS.
PROPER ANGLE
NORMAL

FIG. 1.

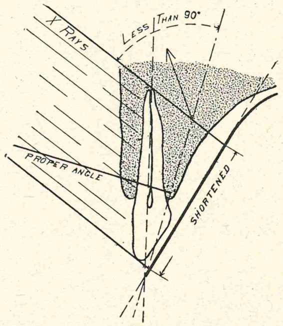

X RAYS
LESS THAN 90°
PROPER ANGLE
SHORTENED

FIG. 2.

Figure No. 1 shows position of Film and angle of Ray adjusted properly. Result will show normal length of tooth.

Figure No. 2 shows angle of Ray when tube is tilted too high. The image on the Film will be too short for proper diagnosis.

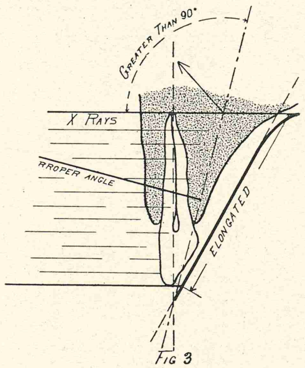

GREATER THAN 90°
X RAYS
PROPER ANGLE
ELONGATED

FIG 3

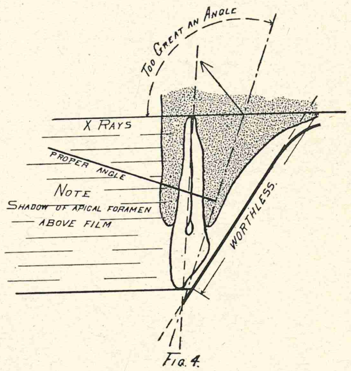

TOO GREAT AN ANGLE
X RAYS
PROPER ANGLE
NOTE
SHADOW OF APICAL FORAMEN
ABOVE FILM
WORTHLESS.

FIG. 4.

Figure No. 3 illustrates position with Tube too low. The resulting image will be too long.

Figure No. 4 illustrates position of Tube so low that the shadow of the apical end of the tooth passes over the top of the Film. The resulting negative is worthless.

Practically the same arguments hold good on Lowers as on Uppers, with the exception that too high an angle on the tube will produce Lengthening, and too low, Shortening.

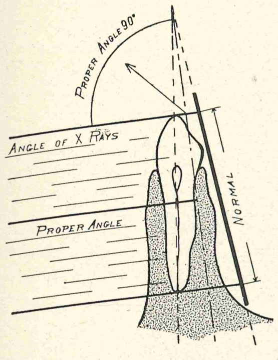

PROPER ANGLE 90°
ANGLE OF X RAYS
PROPER ANGLE
NORMAL

FIG 5

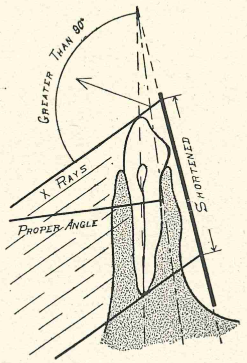

GREATER THAN 90°
X RAYS
PROPER ANGLE
SHORTENED

FIG 6

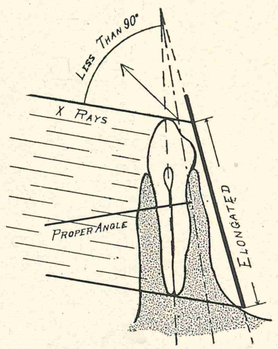

LESS THAN 90°
X RAYS
PROPER ANGLE
ELONGATED

FIG 7.

Figure No. 5 illustrates proper angle of Ray for Lowers. Also proper position of Film.

Figure No. 6 illustrates angle of Ray when tube is placed too low. The resulting image of the tooth will be considerably shortened.

Figure No. 7 illustrates angle of Ray with tube too high. The resulting image on the negative will be lengthened.

In order to show all three roots of molars clearly, it is necessary to make two or even three exposures, from different angles; that is, figuring from front to back. This point you will find illustrated on figure No. 8.

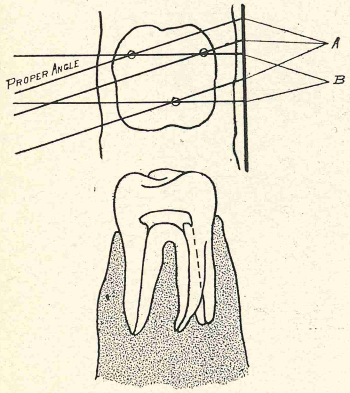

PROPER ANGLE
A
B

FIG 8.

Figure No. 8 shows both lateral view of molar and view of top of crown. You will note, from the lines drawn through the approximate positions of the roots, the different results that may be achieved by using various angles. "A" indicates proper angle for picturing all three roots. "B", indicating position of tube and resultant angle of Ray, will show but two roots clearly, with the third rather indistinct.

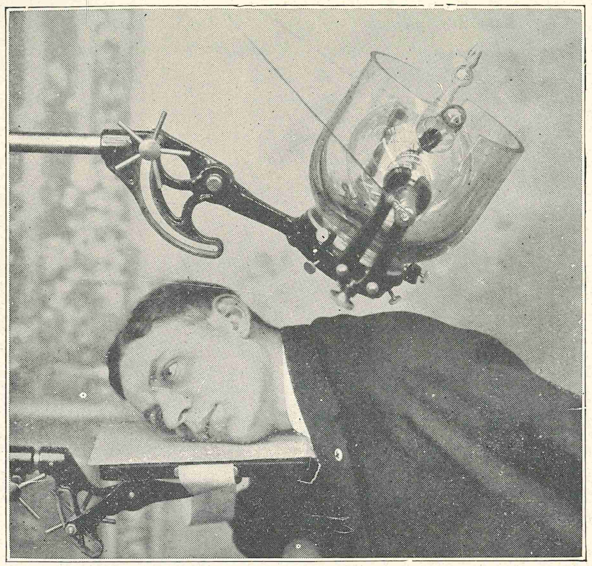


Figure 11

Figure No. 11 shows position of patient and tube for making radiograph of mandible of right side; also takes in teeth as shown on Figure 12.

Figures No. 12 and No. 12A illustrate the result from position No. 11.

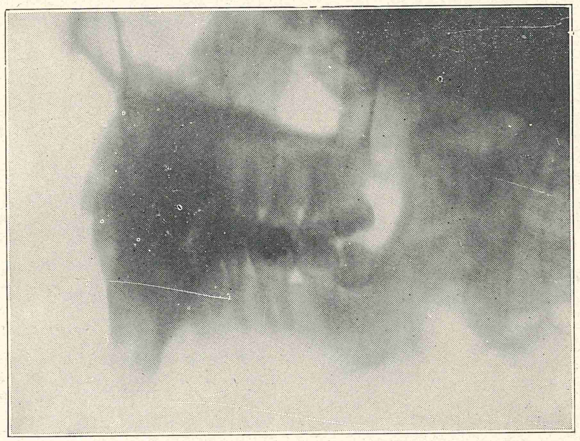


Figure No. 12

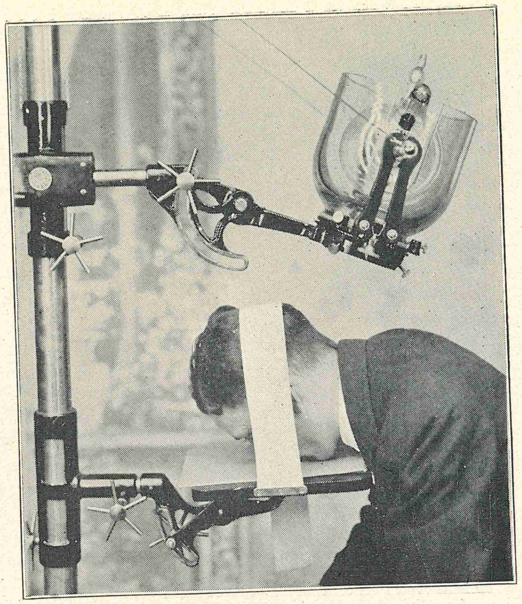


Figure No. 13

Figure No. 13 shows proper position for making radiograph of the antrum of Hymore through back of neck; also the centrals and laterals. (See Figure No. 14.)

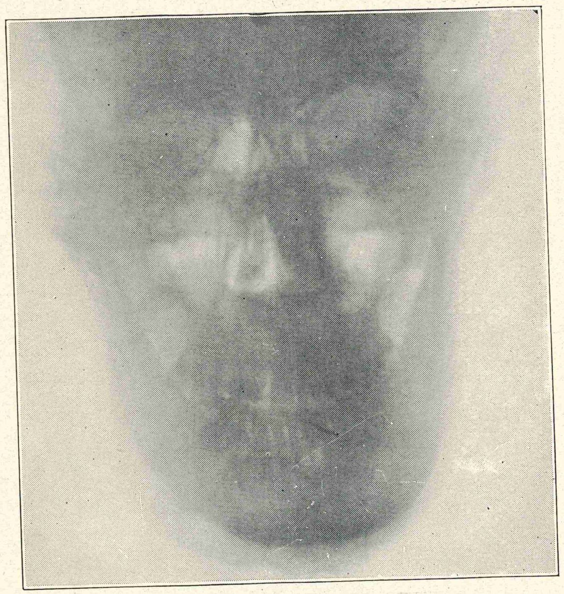


Figure No. 14

Figure No. 14 illustrates the result from position No. 13.

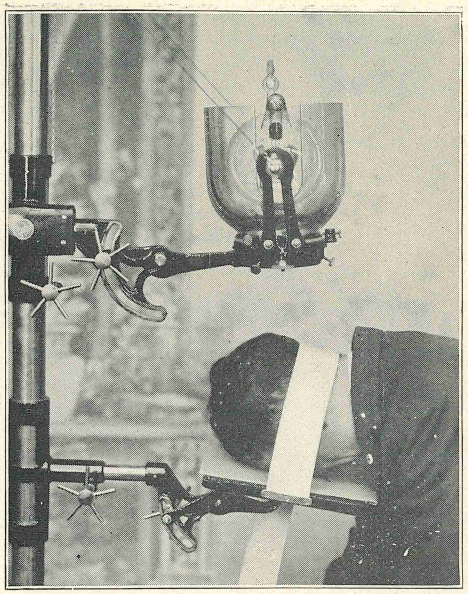


Figure No. 15

Figure No. 15 shows position for making radiograph of the frontal sinuses and antrum of Hymore through back of head; passing rays in line over top of ear and in line with orbits. (See Figure No. 16.)

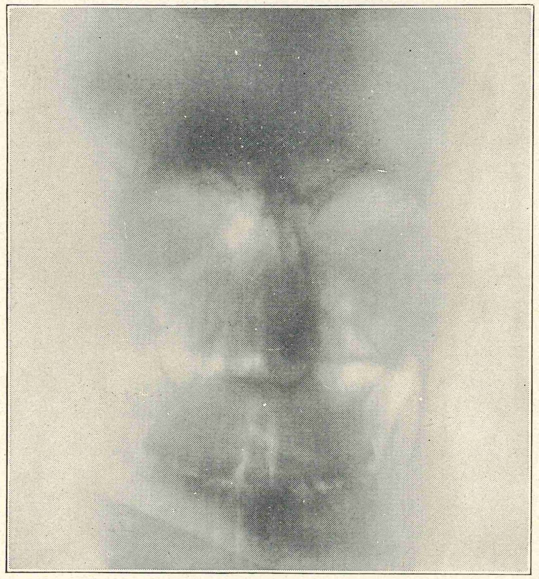


Figure No. 16

Figure No. 16 illustrates result from position No. 15.

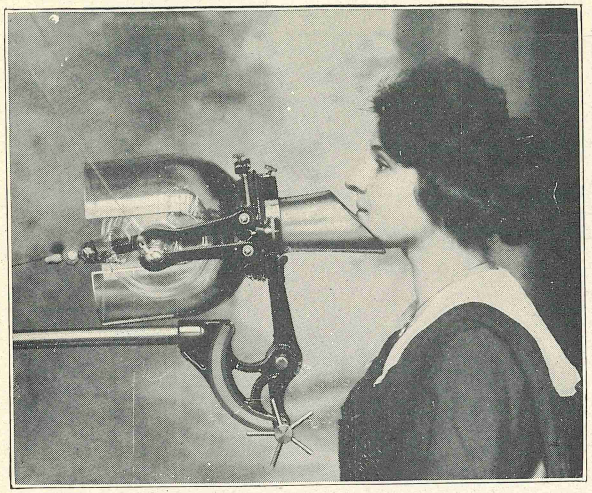


Figure No. 17

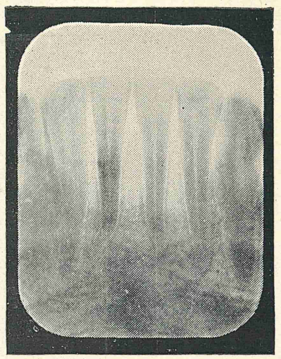


Figure No. 18

Figure No. 18 illustrates result from position No. 17.

Figure No. 17 shows position for making film radiograph of lower centrals and laterals. Head tilted back slightly, tube support tilted all the way back. (See Figure No. 18.)

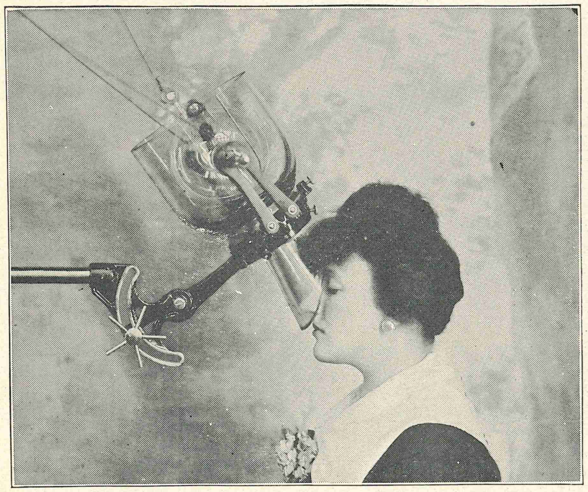


Figure No. 19

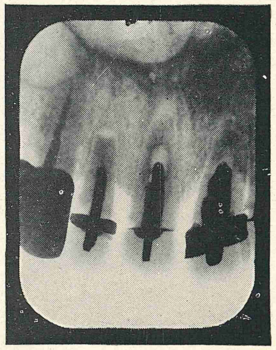


Figure No. 20

Figure No. 20 illustrates result from position No. 19.

Figure No. 19 shows position for making radiograph of upper centrals and laterals. Cut edge of cone parallel with face. (See Figure No. 20.)

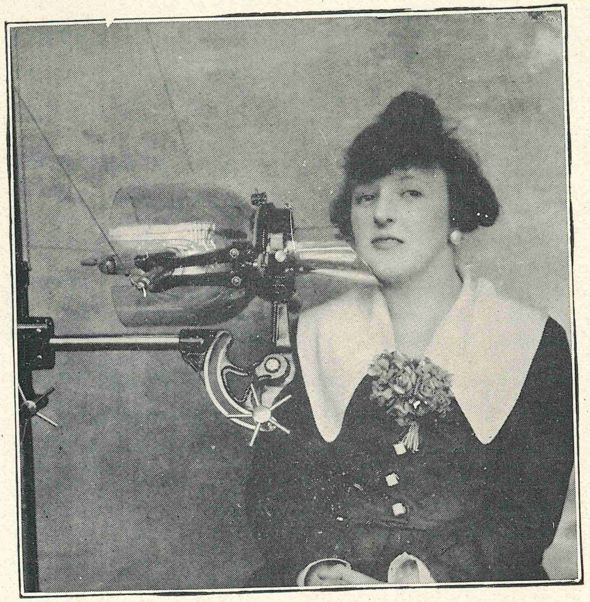


Figure No. 21

Figure No. 21 shows position for making radiograph of lower molars. Head held upright, chin resting in hollow of cone. (See Figure 22.)

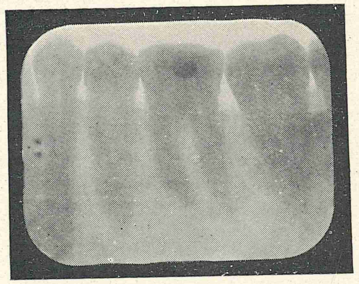


Figure No. 22

Figure No. 22 illustrates result from position No. 21.

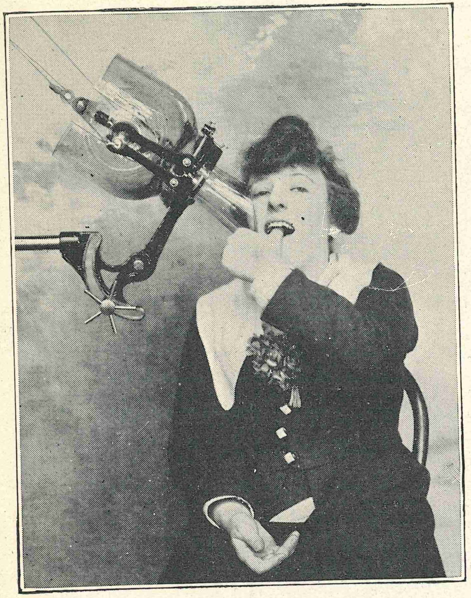


Figure No. 23

Figure No. 23 shows position for making radiograph of upper molars. Cut edge of cone parallel with face. (See Figure No. 24.)

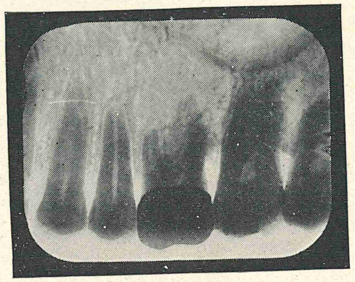


Figure No. 24

Figure No. 24 illustrates result from position No. 23.

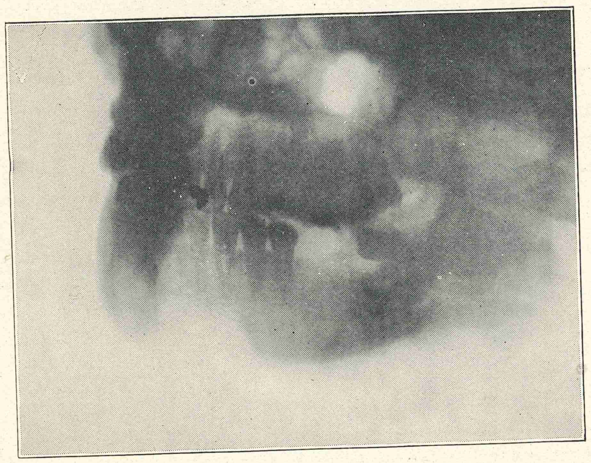


Figure No. 12A

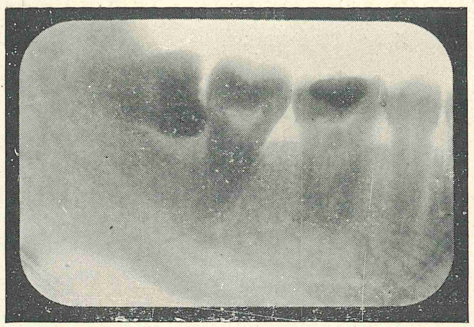


Figure No. 22A

Figure No. 22A illustrates result from position No. 21, when using the medium size (No. 1A) Film.

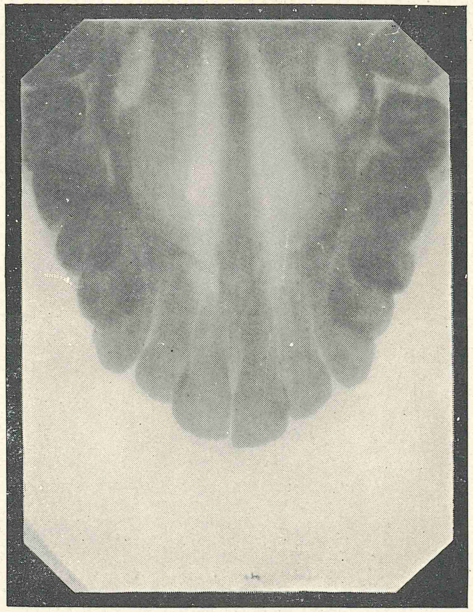


Figure No. 25

Figure No. 25 illustrates result when using the large size (No. 2) film, inserted straight into the mouth, in what is often referred to as the "Bite Method." Have the patient in position similar to that shown in Figure No. 19, but tilt the tube to a slightly higher angle to avoid the lengthening of the image which would result with the tube placed too low. Figures Nos. 22A and 25 are valuable helps where a Roentgen-diagnosis of the entire oral cavity is to be made.

Developing Plates and Films. Loading Plates, Etc.

Keep your plate and film stock in a cool, dry place; dampness, turpentine or oil odors are all equally harmful.

Do not depend on the ordinary wall for protection from the X-Ray. Either keep the films and plates in the lead lined compartment in the cabinet, or in some other lead lined recepticle; or fifty feet from the tube.

Do not load plates into the envelopes in large quantities, unless they are to be used at once. When possible, the plates should be loaded not more than a day or two before you intend to expose them, as the paper has a tendency to fog the emulsion.

The room or space to be used as your dark room must be Absolutely Dark, except for the Ruby Lamp. It must have no cracks, holes or curtains through which even the faintest trace of light can enter, as X-Ray plates are just as sensitive as any photographic plates, and fog easily.

Running water should be had if possible. Keep your Bowls and Trays absolutely clean; rinse them thoroughly both before and after using. Do not use a Hypo Fixing container for Developer; **mark** your trays, and **never** change.

Your dark room equipment should consist of at least two trays, two bowls for films, Ruby Lamp, and glass stoppered bottles for developer and hypo.

When about to load plates, it will be found convenient, saving time and trouble, if you arrange your envelopes before turning out the light. They should be alternated, first laying down an orange and then a black envelope, with flaps toward you, and the seamed sides up. In this way there can be no question as to which envelope is picked up in the dark, nor any delays caused by inserting the plate into the orange envelope first, which on account of its larger size, will not fit into a black one.

By passing the ball of the thumb lightly over the corner of the plate, the film side can be detected, in the dark, it having a fine matte surface in contrast to the other, or clear glass side. Care should be exercised in this, as the glass will cut off some of the ray if the plate is loaded wrong, and the image will appear reversed.

Place the plate with the emulsion side against the smooth blank side of the black envelope; close the flap, and insert flap first into the orange envelope in the same manner, leaving the seamed sides of both turned the same way. When this rule is followed, you can always be sure the film or sensitive side of the plate is turned toward the smooth side of both envelopes; and you will never have trouble taking the radiograph through the glass accidently if the printed side of the orange is turned from the patient.

Another advantage of this is that if the tube happens to be a trifle low in vacuum, the muscilage, and four thicknesses of paper at the seams, will not show up on the finished negative.

Do not overlook the fact that your plates are just as sensitive after loading as before, and should not be allowed in the room with the tube, when same is in use, unless under lead cover.

Developing

To get best results, use some good standard formula; most any Metol Hydroquinone mixture will answer the purpose, but same should be made up to full strength, as X-Ray plates and films have a double or triple coating of emulsion, and the developer must be strong enough to cut through to insure sharply defined negatives.

We recommend the Paragon Developer, which we can furnish put up in cans, ready for use by dissolving in water.

Have your developer at a temperature of between 65 and 68 degrees Fahrenheit. Do not attempt to develop more than five or six plates in any one batch of solution made from a 10-oz. size can; nor more than a dozen Films. You may try this, and imagine that you can develop double that number, but on close examination you will find that the last half will be very inferior in finish and appearance to the first.

(In the following, wherever **Plates** are referred to, **Films** are to be understood **as included.)**

Start developing in the dark, being sure that the plate or films are instantly covered all over with the solution, only using the ruby lamp at intervals to watch that you do not carry development too far. If your plate has had sufficient exposure it should grow denser as the time of development increases.

The films are wrapped in a double covering, and come two in a packet. Separate them before immersing in the solution, or there is danger of both being ruined. Your plate technic will be practically the same as for films. Take plate out of the envelopes; lift one edge of the tray so that the developing solution flows to the opposite edge; place plate in the tray, and quickly drop same flat.

This causes the solution to flow evenly and quickly over the plate, and will prevent streaks which would otherwise show on the finished negative. Continue to rock tray throughout development. Dental films should be handled in the same manner, although there is much less danger of causing streaks on films as on plates.

Five minutes' time is generally sufficient, if tube, exposure, developer and plate are right. At the end of that time your plate should appear about the same shade on front and back, when held under the ruby light, and dense enough that no red light shines through. If this result is obtained in less time, you have overexposed the plate or your developer is too warm. If longer than five or six minutes are necessary, your trouble may be too cold or too weak developer, or under exposure.

A tube of the proper vacuum will make an absolutely dense black on the plate, where there is no image of any object covering. If you can see your fingers through this after developing, you have not used the best technic throughout.

Too high vacuum tubes will not give to plates the desired dense black; they will show lack of contrast, and appear thin.

Too low tubes will give a dense black to the part not covered by an object, but will show the bones and teeth clean and with no detail.

Too long exposure will cause the plates to appear dense all over; while if the exposure has been too short no end of developing will bring out the desired density.

Fixing

After thoroughly developing, wash the plate in cold water, being careful not to touch the emulsion side with the fingers; then place in the Hypo bath. Use an Acid Hypo fixer, strong enough to clear all the milky white appearance off the plate in about five minutes. After plate is clean, allow it to remain in the hypo about five minutes more.

A plate is not ready for final washing as soon as the milky appearance has left, but should be considered only about half fixed. If taken out, washed and dried at this time, you may look for a fogged, stained plate later, as there is sure to be some silver left on it. After the plate has been in the hypo two or three minutes (depending on the freshness of same) it is perfectly safe to open the dark room door or turn on a white light.

After thoroughly fixing, plate should be washed in running water for at least twenty minutes. Where no running water is available, wash for half an hour, changing water at least five or six times. Do not allow a stream of water to run directly onto the plate as you will blister the emulsion. Films are less easily damaged than plates. After washing, the plate should stand on edge to dry; films should be hung up in clips. Never dry them in sunlight, as it increases the density, and is apt to melt the emulsion.

Developing Don'ts

Do not attempt to use old developer or old hypo.

Do not use Warm Developer.

Do not examine plate by white light until thoroughly fixed.

Do not use too bright a ruby light. Our No. 1600 Lamp is perfectly safe.

Do not allow the ruby light to shine directly onto the plate throughout development. Any lamp will cause some fogging if this is permitted.

Do not take the plate from the developer, to fix, until it is perfectly dense under the ruby light.

Do not use Pyro developer on X-Ray plates and films, as, although it is extensively used for landscapes and portraits, it seldom gives good results on Radiographs.

When finished, study your plate; decide how to improve it; decide to make the next one better, and in a surprisingly short time you will find you have mastered the game.

The average photographer should never be given X-Ray Plates or Films to develop, unless he is thoroughly instructed as to how to handle them. A photographer is guided entirely by the appearance of the image on the negative, and is apt to take them out of the developer too soon. Poor radiographs are the result, and you will blame the machine or tubes when really all the trouble lies in the dark room. For the above reasons, we earnestly recommend that all Development be done in your own office.

Remember: you cannot see through a Good Negative when it is fully developed, when held up to the ruby light.

The length of development depends largely on the speed of the Plates used, the time of exposure, vacuum of the tube, strength of the developer, temperature of the solutions, and the purity of the chemicals used. We endorse the Paragon Plates, as being sure to give best results.

Always rinse the hands thoroughly after dipping in hypo or developer, as some chemicals have a somewhat poisonous effect on some people, as well as staining the fingers.

Always remember that **one** drop of Hypo in your Developer will ruin it; and if the fingers have any hypo on them and a plate is touched while developing, a patch of stain or fog will result.

Good diagnosis is as important as good radiographs. Learn to look for the unexpected, and do not be a mere Photographer. Text-books and Radiography do not always agree as to the location and shape of parts, but a thorough knowledge of anatomy will assist greatly in focusing the tube, and knowing how the parts should look on the finished negative. A good illuminating box, covered on the inside with a flat white surface, is almost absolutely necessary for the correct examination of negatives.

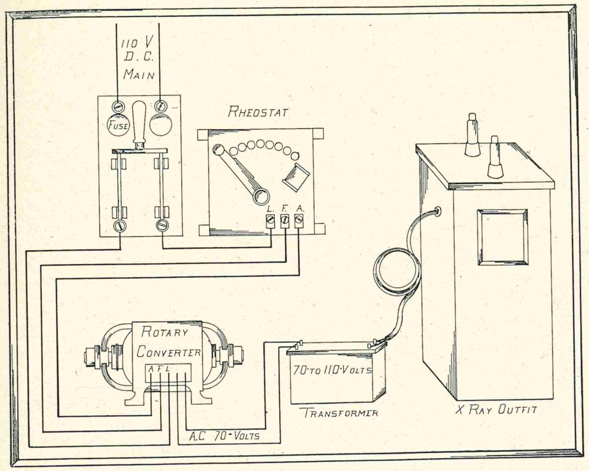
For the Dentist who has some Body X-Ray work to take care of occasionally, the following should be of some interest:

It is always advisable to have the patient's clothing removed from the part to be radiographed, as it is easier to place the tube and plate properly, and because buttons and other objects cause shadows which will greatly interfere with the diagnosis on body work. The part to be radiographed should always be nearest to the plate, and in as close actual contact as possible.

Do not use your hand continually in front of the Fluoroscope to test the penetration of your tube, as this is bound to leave a bad effect in time. If a little care is used, no danger of burns need be feared by the operator for himself or patient. Practically all of the Burns we hear of were produced years ago, due to lack of knowledge of the ray.

Nowadays Burns from the X-Ray exposure in Dental work especially, are practically unknown. This is due to the recognized fact that the effects of the ray are cumulative in living tissue. The average exposure in dental work, including plate work, is only about four seconds; while the length of exposure necessary to produce a burn, or even an erythema, would be many minutes with the average machine and tube.

If there is much radiography to be done, however, the best safety device is a lead protection screen. The glass bowl surrounding the tube on the stand contains forty per cent lead, and if the operator will make it a point to stand, not in the direct path of the Rays, but on the side or behind the tube, he need have no fears whatever.



Electrical Supply

Where a Direct Current only is available, a Rotary Converter is required, to convert the Direct to Alternating, as a Transformer can be operated on the Alternating Current only. The accompanying diagram shows connections for the converter.

Some Hints on Diagnosis

In examining Negatives, we should bear in mind the fact that very dense tissues are characterized by White areas, while less dense tissues appear Darker; and the **absence** of tissue is indicated by **blackness.** To avoid confusion, we must remember that in Prints and lantern slides the above is reversed.

The Radiograph is not a Picture of Disease. It is a record only of the varying resistance to the passage of the X-Ray offered by the parts pictured. The Interpretation of the meaning of these shadows, and the decision as to whether they are caused by pathological conditions or not, requires on the part of the diagnostician a full knowledge (1) of Anatomy, which must be coupled with (2) the Symptoms, (3) the clinical examination, (4) the present and past condition of the portion being Rayed, and (5) due consideration of the possible effects of the treatment already given.

A dark shadow on a film around the apex of a tooth means, naturally, that at this particular portion of the alveolis there is a lessened density, loss of obstruction to the passage of the Ray, and increased permeability; and inasmuch as it is the Calcium Salts in bone that produces the shadow on a photographic plate or film, this dark apical shadow would naturally indicate a loss of lime salts, i. e., decalcification.

The X-Ray will, in the majority of instances, if the correct technique is employed, record on the film any abnormal or diseased condition which may be present beneath the surface. Healthy tissue has more resistance to the Ray than any diseased tissue; therefore more of the Ray strikes the film through the diseased tissue than through the healthy tissue; consequently, the portion of the film behind the diseased area will be darkened as compared to the portion behind the healthy tissue, teeth, fillings, crowns, foreign bodies, etc.

In Root Canal investigation it is advisable, when possible, to insert a broach, wire, or temporary filling before the film is made. By this method, the length size and direction of the canal can be shown plainly.

The statement that the X-Ray proves that a tooth has been filled properly or not is open to question. Some solutions and filling materials do not show shadows in all parts of the canals. It depends on the solidity of the filling cones or other agent used, and whether metal is used or not. Unless a sufficient quantity of filling material is present to cast a shadow it is very often not reproduced.

In a recent issue of the International Journal of Orthodontia there appears the following: "In seeking out the various anomalies and pathological conditions to which the teeth and oral structures are subject, we should not be misled by indefinite shadows upon X-Ray Plates and Films. The very nature of these structures, their gross as well as minute anatomy, renders them somewhat difficult to radiograph, and necessitates a refinement of technic greater than that demanded with most of the other portions of the human body. Therefore, only radiographs made in accordance with a definite and exacting technic should be relied on for diagnosis.

If a doubt exists in any given instance, an additional or even two more exposures should be made, so that any conclusion reached will be founded upon definite evidence."

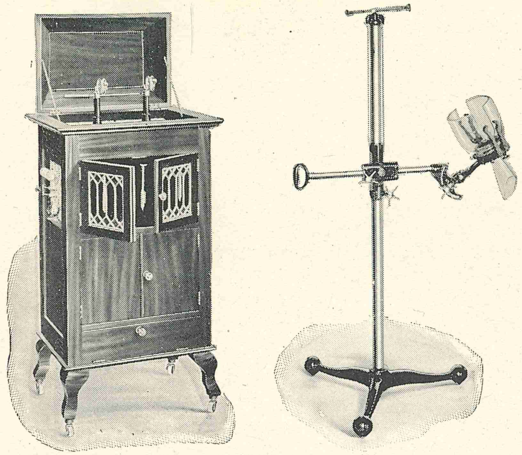
This subject is being gone over so thoroughly and so repeatedly in most every journal of Dentistry which one can pick up, that there is no need of going deeper into it. These well described cases, generally fully illustrated, will prove a wonderful help to any dentist who will but take time to look them up.

The following are sixty-three cases in which the X-Rays are not absolutely indispensible, but in which Radiographs will prove a wonderful aid.

The Uses of Roentgen Rays in Dentistry

1. In cases of delayed eruption to determine the presence or absence of the unerupted teeth.
2. In cases where deciduous teeth are retained long after the time when they should have been shed, to learn if the succedaneous teeth be present.
3. To learn if the roots of children's teeth are fully formed.
4. To determine whether a tooth be one of the primary or secondary.
5. To determine when to extract temporary teeth.
6. To show the Orthodontist when he may move the coming permanent teeth by moving the deciduous teeth.
7. To observe moving teeth.
8. In cases of supernumerary teeth.
9. In cases of impacted teeth as an aid in extraction.
10. To determine the number of canals in some teeth.
11. As an aid in filling canals with large apical foramina.
12. To learn if canals are opened and enlarged to the apex before filling and to observe the canal filling after the operation.
13. To determine whether an opening leading from a pulp chamber be a canal or perforation.
14. In cases pulp stones (Nodules).
15. In cases of secondary dentin being deposited and pinching the pulp.
16. To learn if the filling in the crown of a tooth encroaches on the pulp.
17. In cases of teeth with large metal fillings or shell crowns which do not respond to the cold test, to learn if the canals are filled.
18. To learn if the apical sensitiveness is due to a large apical foramin or an unremoved, undevitalized remnant pulp.
19. In cases of Chronic Pericementitis (Lame Tooth).
20. In cases of alveolar abscess to determine which tooth is responsible for the abscess.

21. In cases of alveolar abscess to determine the extent of the destruction of the tissue bone and tooth.
22. In cases of alveolar abscess to determine how many teeth are involved.
23. In cases of abscess of multirooted teeth; to learn at the apex of which root the abscess exists.
24. In cases of crowned teeth which are abscessed to learn if the canals are filled.
25. As an aid in differential diagnosis between Chronic Alveolar Abscess and Pyorrhea Alveolaris.
26. To observe destruction of tissue due to Pyorrhea Alveolaris.
27. In cases of Pericemental Abscess.
28. In cases of persistent suppuration which do not yield to the usual treatment. In fact all cases that do not yield promptly to the usual course of treatment.
29. To observe the course of the Fistulous Tract.
30. To observe the field of operation before and after Apicoectomy.
31. To locate foreign bodies, such as a broach in the canal or tissue at the apex of a tooth; a piece of wooden tooth pick in the Peridental membrane, etc.
32. To determine the presence or absence of a bit of root imbedded in the gum tissue.
33. To diagnose fracture of a root.
34. To observe the size and shape of roots of teeth to be used in crown and bridge work.
35. As an aid and safeguard when enlarging canals for posts.
36. To examine bridges about which there is an inflammation.
37. To observe the field before constructing a bridge.
38. To observe planted teeth.
39. In cases of cementoma.
40. In cases of bone whorls.
41. To locate stones (Calculi in the Salivary ducts or glands).
42. In cases of Bone Cysts.
43. In cases of Dentigerous Cysts.
44. In cases of tumor, benign or malignant.
45. To observe anomalous conditions, such as the fusion of the roots of two teeth for an example.
46. To observe the location and extent of a necrotic or carious condition of the bone.
47. To diagnose Antral Empyema.
48. To observe the size, shape and location of the antrum, as an aid in opening into it.
49. To locate foreign bodies, such as tooth roots or broaches in the antrum.
50. To observe cases of luxation before and after reduction.
51. In cases of fracture of the jaw.
52. In cases of Ankylosis of the Temporo-Mandibular Articulation or the joint former by the tooth in the jaw.
53. To observe the field of operation before and after resection of the Mandible.
54. In all cases of Facial Neuralgia with an obscure Etiology.
55. To observe the Inferior Dental Canal.
56. In cases of Ludwigs Angina.
57. In cases of Insomnia, Neurasthenia, Insanity and kindred Nervous disorders.
58. In cases of periodic Headaches.
59. In cases of Facial Gesticulatory Tic (Spasmodic Twitching of a set of the facial muscles).
60. To allay the fears of Hypochondriac.
61. In cases where the patient cannot open the mouth wide enough for an ocular examination.
62. In cases of hidden Dental Caries.
63. In research work to study osteology, the development of the teeth, the action of Bismuth Paste, Bone Production and Destruction, Changes occuring in the Temporo-Mandibular Articulation when jumping the bite, Blood supply to parts. Resorption of teeth and the causes for it, etc.

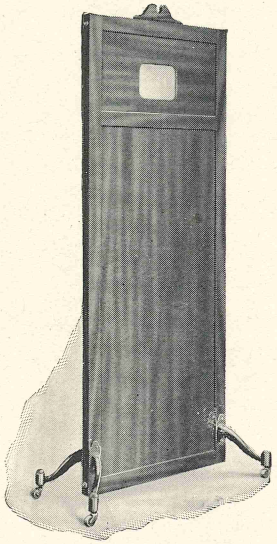


Type "H5"

The "H5" Outfit, as it should appear, set up and ready for use.

Outfit No. 510
Code "ACCRET."
Price $375.00.

The following is a partial list of accessories of particular interest to the Dental Roentgenologist.



Lead Protection Screen

Designed and built for the X-Ray operator who desires the maximum protection from the rays. Made of $\frac{1}{16}''$ sheet lead, covered over all with mahogany or oak panels. Size over all, 27"x6". Has an 8"x10" Lead Glass Window, to enable the operator to observe the patient and watch the tube in action, without exposing himself. Handsome in appearance; durable in construction. Mounted on large free rolling casters, it is easily moved about.

No. 349—Fischer Protection Screen, Oak Finish code **Anker,** price	$40.00
No. 350—Fischer Protection Screen, Mahogany Finish, code **Alum,** price	40.00
No. 351—Fischer Protection Screen, Solid Mahogany, code **Amara,** price	50.00

Fischer Plate Support

Arranged to fit our Protection Stand No. 1005, as furnished with the "H5" equipment. An exceedingly handy arrangement for supporting plates while making radiographs of extremities, and for all forms of Head Work. Very practical for Dentists. The supports are all metal, partly Enameled and Nickel Plated to match the balance of the stand. The top plate is of wood, with a canvass band and clamp to hold down the part to be radiographed. Easily adjusted to any position.

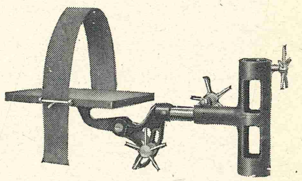


Figure No. 975

No. 975—Plate Support, Black or Mahogany Finish, Code (**Dolor**). Price__$15.00

Fischer Adjustable Head Rest with Chair Clamp

Especially useful to the dentist as an aid in supporting the head of the patient while making Dental Radiographs. Can be attached to any chair. Made of all metal, part nickel plated and part enameled.

No.1012—Fischer Head Rest
Code (**Calsis**). Price__$7.50

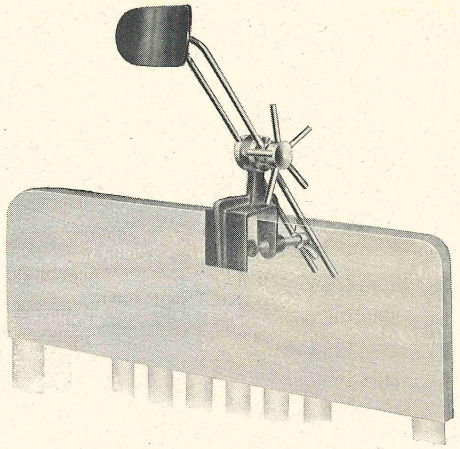


Figure No. 1012

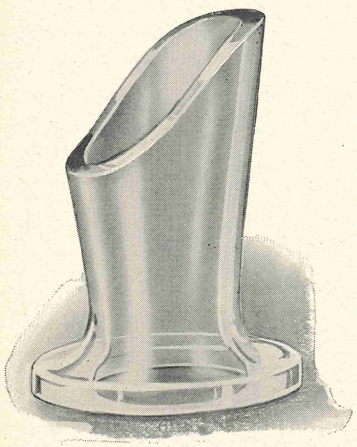


Figure No. 1010

Lead Glass Dental Cone

For cutting off all except those X-Rays necessary for Dental Film work. The glass is shaped to conform to the shape of the face, not only affording a rest to hold the patient steady during an exposure, but focusing the Rays where they are needed. Gives exact position for all uppers automatically, and insures maximum of perfect results with the least amount of "chance." Indispensible to anyone doing a considerable amount of Dental Radiography. Fitted to our No. 1005 Protection Tube Stand.

No. 1010—Lead Glass Cone, Code (**Carus**). Price____________________$7.50

Lead Lined Compression Cone

To properly retain the Rays when making plates of the entire skull, or for all kinds of body work, a Lead Lined Compression Cone, will be found very convenient and a very handy adjunct. Five inch diameter.

No. 1009—Lead Lined Compression Cone, Code (**Dura**). Price_____________$5.00

X-Ray Tubes

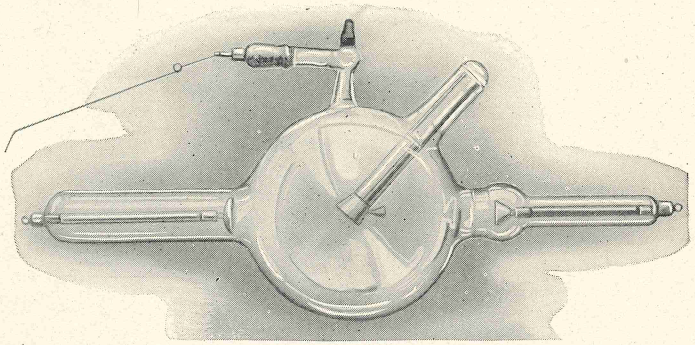


Figure No. 1000

The Type "H5" cabinet requires a specially constructed X-Ray Tube to deliver its maximum efficiency. These come in two sizes, and we are prepared to ship, at all times, perfect tubes, carefully tested for our particular machine. We have a well equipped factory for the manufacture of all types of Tubes, with an efficient corps of experienced glass blowers, which enables us to supply the best possible goods with the least possible delay.

Many operators prefer the seven inch tube to the six inch size, claiming that they remain cooler and with more constant vacuum. Results on Dental work will be about equal with either size.

No. 1000—6″	Platinum Target, Code	**(Edea).**	Price $23.50
No. 999—7″	" " "	**(Educt).**	" 28.50
No. 997—6″	Tungsten " "	**(Eigon).**	" 33.50
No. 997—7″	" " "	**(Eiloid).**	" 38.50

X-Ray Tube Repairs

When an X-Ray Tube has become punctured, the minute hole can frequently be sealed over and the tube re-exhausted. When a tube has been over-reduced, and the usual method of careful, repeated warming and cooling does not serve to raise the vacuum back to normal, re-exhaustion is necessary. When the terminal ends are cracked in such a way that they can be resealed, repairs will be made at the same price as ordinary punctures. Punctures in the round bulb of tube are almost impossible to repair, and we will attempt same only at owner's risk.

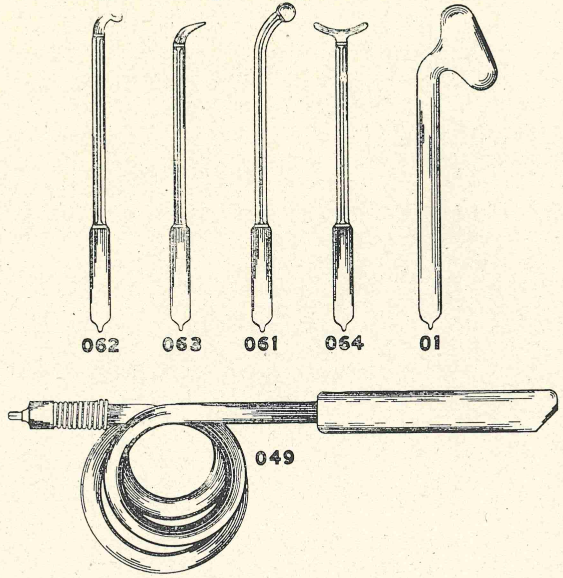
However, where cracks are beyond repair, rebuilding will be necessary. In re-building, we use only the Anode of the old tube, which is placed in a new bulb, with new cathode and regulator, and the finished article as returned to you will work as well as a new tube.

X-Ray Tubes sent to us for repairing should be sent to us by Parcels Post, or Prepaid Express. Package should be marked **Fragile Glass,** and carrier informed that same contains a valuable **X-Ray Tube.** This will insure its receiving careful handling.

PRICES FOR REPAIRING

Re-exhausting and mounting new regulator......	6″ Tube,	$ 5.00	7″ Tube	$ 6.50
Repairing Puncture and mounting new regulator	6″ "	6.50	7″ "	8.50
Complete Rebuilding	6″ "	15.00	7″ "	22.50

High Frequency Electrodes



Dental High Frequency Electrodes and Handle

All our Glass Electrodes are made by us, of the very best glass obtainable; carefully annealed. While we make a great many varieties for different kinds of High Frequency treatments, there are but five types of interest to dentists.

No. 01—For general Surface Treatments,	Code **(Blain).**	Price............	$ .75
No. 061—Insulated Dental Pyorrhea.	Code **(Brein).**	Price............	1.50
No. 062—Insulated Dental Cocain.	Code **(Bridge).**	Price............	1.50
No. 063—Insulated Dental Cavity.	Code **(Bridle).**	Price............	1.50
No. 064—Insulated Dental Outer Gum.	Code **(Brim).**	Price............	1.50

Many operators complained of the danger of shocking either themselves or their patient while using the regular type of High Frequency Handle, and we therefore designed the No. 049 Insulated Handle, which has no exposed contacts, and is absolutely Shock Proof. Made entirely of one piece of Hard Rubber, with the heavy insulated connecting cord fastened securely to the spring brass clamp inside.
No. 049—Insulated Shock Proof Handle, ½″ size, Code **(Blind).** Price......$2.00

Fischer Dental Film Illuminator

Designed for illuminating Dental Films only. The Ball Hood, enclosing the Tungsten lamp, is finished in White Enamel, to match the porcelain lamp receptacle, which is in turn mounted on a polished Mahogany base. Spring clips are mounted on the sides to hold our special Film Mounts No. 1587, and will accommodate either the All Celluloid or Black Mounts described herewith. Illuminator has green Silk connecting cord and swivel plug, ready to attach to any lamp socket.

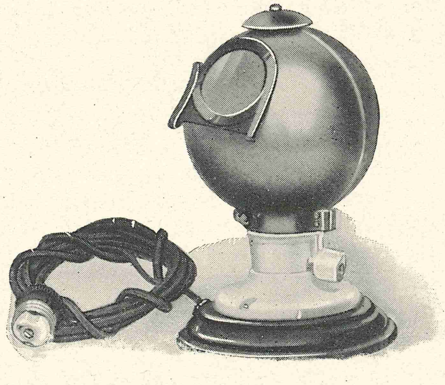


Figure No. 560

No. 560—Fischer Dental Film Illuminator, Code **(Bovine).** Price............$7.50

Black Dental Film Mounts

Dental Film Mounts, made of Black pressed cardboard, with Celluloid windows, give fine contrast and bring out every film detail with distinctness. They afford protection to the finished negative, and provide a most convenient form of holder for viewing, filing and recording Dental Films. They not only increase the detail in the negative, making them valuable from a diagnostic standpoint, but act as an excellent advertisement when sent out. Also lessens the danger of loss of films.

BLACK DENTAL FILM MOUNTS

No.	Code	Size of Mount	No. of Films	Position of Films	25	50	100	200	500
620- 1	**Ibex**	3 x5	1	Horizontal	$2.60	$2.90	$ 3.90	$ 6.30	$13.50
621- 2	**Icon**	3 x5	1	Vertical	2.60	2.90	3.90	6.30	13.50
622- 3	**Ictus**	3 x5	2	Horizontal	3.40	3.80	4.50	7.50	16.50
623- 4	**Idea**	3 x5	2	Vertical	3.40	3.80	4.50	7.50	16.50
624- 5	**Idle**	3 x6	3	Horizontal	3.70	4.20	5.50	9.50	21.50
625- 6	**Idyl**	3 x5	3	Vertical	3.70	4.20	5.10	8.70	19.50
626- 7	**Image**	3 x7½	4	Horizontal	4.90	5.90	7.30	13.10	30.50
627- 8	**Imbue**	3 x6	4	Vertical	4.70	5.50	6.70	11.10	25.50
628- 9	**Impel**	3 x9	5	Horizontal	5.40	7.00	10.00	18.00	42.00
629-10	**Imply**	3 x7½	5	Vertical	5.20	6.40	9.00	16.00	37.00
630-11	**Inane**	4 x9¼	10	Horizontal	7.80	9.00	15.00	28.00	67.00

ALL CELLULOID FILM MOUNTS

No.	Code	Size of Mount	No. of Films	Position of Films	25	50	100	200	500
631-12	**Grub**	3¼x4½	1	Horizontal	$2.80	$3.60	$ 4.80	$ 8.90	$21.20
632-13	**Guaco**	3¼x4½	2	Vertical	3.30	4.20	5.50	10.20	22.30
633-14	**Guad**	2¾x6¼	3	Horizontal	4.50	5.70	6.90	12.30	28.50
634-14v	**Gull**	3 x5	3	Vertical	4.50	5.70	6.90	12.30	28.50
635-15	**Gum**	3⅞x4½	4	Horizontal	5.50	6.40	8.00	14.00	32.00
636-16	**Gutta**	3 x7¾	5	Vertical	6.30	7.80	9.00	16.00	37.00
637-17	**Gyre**	4 x10	10	Horizontal	8.00	11.00	16.00	30.00	72.00
638-17v	**Gross**	4¼x9	10	Vertical	8.00	11.00	16.00	30.00	72.00
639-18	**Grove**	2¾x4¼	1	Horizontal	2.70	3.50	4.50	8.00	18.50
640-19	**Groan**	2¾x4¼	2	Vertical	2.90	3.80	5.20	9.30	21.50

These prices are for the 1¼x1⅝ film size and include imprinting with customer's name and address.

Prices will be quoted on request for Special Forms, Special Sizes, and for **Films of other sizes.** In requesting prices for any special items, please send a Diagram indicating your needs, and the printing to appear thereon.

Fischer Special Film Mounts

Made of two sheets of paper, glued together as one, but arranged with a slide down the center through which the films are admitted. Specially designed for use with our No. 560 Illuminator.

A great drawback to the Celluloid holders is their high cost, so we have designed this paper mount and placed it on the market at a very reasonable figure. There should be a record kept on file for every exposure made, and unless the filing cost is kept down, this feature is too often neglected. These holders have holes punched out to conform to the size and shape of the regular No. 1 Film. Size of card 3x5 inches.

	100	250	500	1000
No. 1587—Fischer Film Mount, Code **(Bromol).** Price	$1.95	$4.50	$8.50	$16.50
Prices for imprinting name and address	.75	.90	1.15	1.65

Aluminum Film Holder

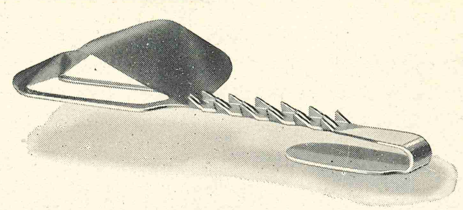


Figure No. 1646

For holding the Dental Film, of any size, during Developing, Fixing, and Drying. Marking the record number or letter of the case on the small roughened tab serves to identify same when more than one set are being developed at one time. The fingers can also be kept perfectly dry and clean during the whole operation. Made of Aluminum, stamped in one piece, they are practically indestructible.

No. 1646, Code **(Casein).** Price each----------$0.15. Per dozen------------$1.25

Dental Films

The Eastman **Negative** Films, packed two in a packet, are arranged to place directly in the mouth; no extra preparation being necessary. They are water and light proof. Sold in three handy sizes.

No. 1640—Size 1¼″x1⅝″; Code **Brain.** Price per dozen pairs	$ .50
No. 1642— " 1⅝″x2¼″; Code **Branc.** " " " "	.85
No. 1643— " 2¼″x3 ″; Code **Brash.** " " " "	1.75

The Eastman Positive Films, having a Slower emulsion than the Negative, but preferred by some operators as showing more detail, furnished at the same prices as above. Unless otherwise specified, the **Negative** will always be furnished.

X-Ray Plates

The Paragon X-Ray Plates are made expressly for fine Radiographic work. They can be relied on at all times, as they run uniform in speed, and will make negatives of the highest class with fine detail and deep contrasts, with comparatively short exposures. The finest bone structure or soft tissue details are rendered on these plates even with small apparatus, where the use of inferior plates would be out of the question.

	With 2 Env.	With 12 Env.
No. 1618—Size 5 x 7 ; Code **Febris** Price	$1.40	$1.65
No. 1619— " 6½x 8½; Code **Felon** "	2.10	2.50
No. 1620— " 8 x10 ; Code **Femur** "	3.00	3.50
No. 1621— " 10 x12 ; Code **Fern** "	5.15	5.90
No. 1622— " 11 x14 ; Code **Ferric** "	7.25	8.25
No. 1623— " 14 x17 ; Code **Fervin** "	11.25	13.00

We will furnish other brands of plates if desired.

X-Ray Envelopes

These are sold in sets consisting of a heavy Black Light Proof Envelope, into which the Plate is placed, this envelope fitting inside an orange wrapper. The outer envelope has a regular printed form on it for the data of the case. Two sets of envelopes accompany each dozen plates, gratis.

No. 1540—Size 5x 7; Code **Fania.** Price per dozen sets	$ .30
No. 1541— " 6x 8; " **Fango.** " " " "	.45
No. 1542— " 8x10; " **Farad.** " " " "	.60
No. 1543— " 10x12; " **Farna.** " " " "	.95
No. 1544— " 11x14; " **Favus.** " " " "	1.25
No. 1545— " 14x17; " **Faun.** " " " "	2.25

Developer in Packages

Metol Hydroquinone Developer, put up in handy packages for convenience of those who do not care to mix their own chemicals. Comes in four sizes, for 10 and 20 ounces, and one-half gallon and one gallon of solution.

No. 1610—For ten ounces solution; Code **Funi.**	Price	$ .20
No. 1611—For twenty ounces solution; Code **Fur.**	Price	.30
No. 1615—For one-half gollon solution; Code **Foxie.**	Price	.90
No. 1616—For one gallon solution; Code **Fuller.**	Price	1.65

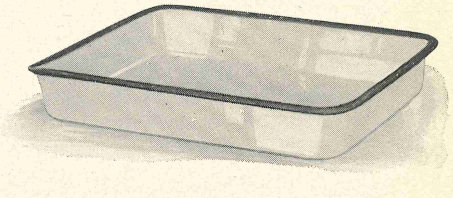
Acid Fixing Bath

Ready to dissolve in water. Small quantities can be measured out as desired.

No. 1613—One Pound Package; Code **Fusin.** Price $ .25

Steel Enameled Developing Trays

Our Developing and Fixing Trays are the best obtainable, made of heavy sheet steel, and stamped in one piece. Coated with four layers of White Enamel. Made in this way, they are absolutely Acid and Chemical proof, at the same time being lighter and stronger than Rubber or Porcelain.



Developing Trays

No. 1604—For	5x 7	Plates;	Code	**Adeps.**	Price	$ .75
No. 1605— ‘‘	8x10	“	“	**Adler.**	“	1.00
No. 1606— ‘‘	10x12	“	“	**Agaric.**	“	1.50
No. 1607— ‘‘	11x14	“	“	**Agave.**	“	2.25
No. 1608— ‘‘	14x17	“	“	**Agnea.**	“	3.50

Porcelain Developing Bowls

Will be found more convenient than trays for developing Dental Films. Especially suited for use with our No. 1602 Portable Dark Room, and in connection with our No. 978 Aluminum Film Holders.

No. 1609—Developing Bowl; Code **Adult.** Price $ .18

Portable Developing Box

Designed for those who are limited to office space, and yet do not wish to entrust their developing to a photographer. For Developing and finishing Dental Films. Equipped with sleeves with flexible arm bands, and arranged to permit its being used in any room, whether light or dark. Has a Ruby Lamp inside, with an extra protection of Ruby and Orange glass, making it perfectly safe. Will be found a most complete and handy adjunct to a Dental X-Ray Equipment. Priced complete, ready to attach to your electric light socket.

No. 1602—Fischer Developing Box; Code **Carum.** Price $25.00

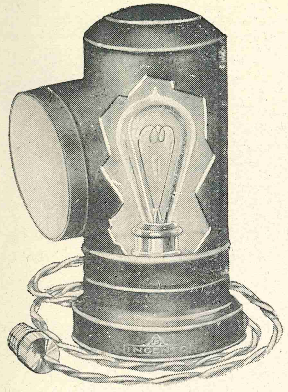


Figure No. 1600

Electric Ruby Lamp

In the Dark Room, much care must be used not to fog the negatives with an imperfect Ruby Light. Much of the appearance of the finished Films and Plates depends on the care exercised during development, and unless your Ruby Light is perfectly safe, poor results may be looked for. The Fischer Lamp **is** safe; a neat, compact article designed to stand on a shelf or the sink. Made entirely of metal, with a sheet of Ruby, Orange and Ground White Glass as a window. The full light may be thrown on the tray or by slightly turning the lamp, the tray may be left in the dark.

Furnished with Lamp, Cord, and Connecting Plug.

No. 1600—Electric Ruby Lamp, Code **Acoria.** Price $2.50

Illuminating Box

For examining X-Ray Negatives up to and including size 8x10. Frame made entirely of metal. Has Opal Glass front, with sheet of special diffusing material set immediately behind, insuring a perfect lighted surface for diagnostic purposes. Tungsten lamp illumination.

No. 551—Negative Illuminator, Code, **Daft.** Price $7.50

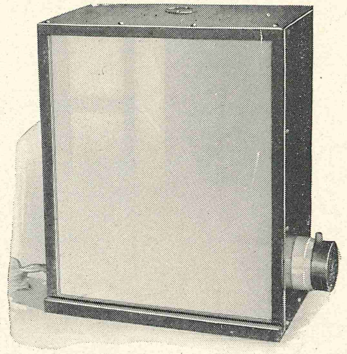


Figure No. 551

Very often an illuminating rack or cabinet to fit some certain section of the office or laboratory is desirable. Where much X-Ray work is being done, a few specimens of that work, set in a rather conspicuous place, will act as a valuable bit of harmless advertising.

We are prepared to submit to you, sketches drawn up to accommodate any number of any size plates, if you will but let us know your requirements. Prices moderate.

Wooden X-Ray Tube Racks

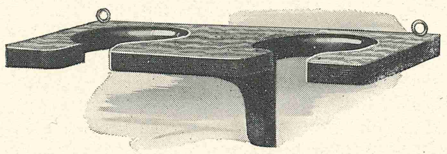


Figure No. 375

We recommend these racks as being the best designed Tube support made. No metal whatever used in the construction. Arranged to hang on the wall out of the way, and to hold two or more tubes. Handsomely finished in mahogany.

No. 375—X-Ray Tube Rack; Code **Echo.** Price $1.50

Portable High Frequency Generator

For the operator who desires a High Frequency Unit as a separate feature, in portable form, we have designed our Type "F". In submitting this machine to the Dental Profession, we combine Simplicity, Durability and Practicability in the most powerful and best controlled magnet type generator on the market.

Type "F" has a capacity of 60,000 Volts, and can be adjusted down to Zero potential. Type "F" has a Frequency (oscillations) Controlling Device enabling the operator to treat the most sensitive areas with absolutely **no** sensation to the patient, or to deliver the heavier currents for surface massage.

Type "F" can be instantly connected to any lamp socket, either Alternating or Direct Current. A Compact, Neat, Durable, fully Guaranteed Outfit, about which we will be glad to write you more; on application.

No. 482—Dental High Frequency Outfit, consists of:
- 1—No. 479 Portable Generator, Type "F",
- 1—No. 01 Surface Electrode,
- 1—No. 061 Insulated Pyorrhea Electrode,
- 1—No. 062 Insulated Cocain Electrode,
- 1—No. 063 Insulated Cavity Electrode,
- 1—No. 064 Insulated Outer Gum Electrode,
- 1—No. 049 Insulated Shock Proof Handle, with Heavy Protected Cord attached, Code **Abies.** Price ------------------------------$32.50

Cautery and Diagnostic Light Transformer

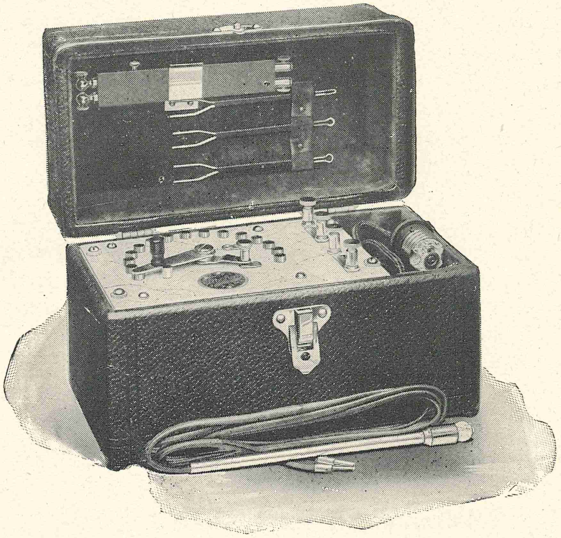


Figure No. 470

The Fischer Cautery and Diagnostic Light Transformer is a compact, neat generator of the Closed Core Type, consuming very little energy, yet having power and sufficient output to properly heat any of the standard instruments on the market; The Mouth Lamp, Gutta Percha Excavator, Cautery, Bleacher Point, Wax Spatula, Antrum Lamp, etc. The lamp circuit has a range from one-half to twelve Volts. Circuits are perfectly regulated and durably wound.

The Case is covered with black leatherette; contact buttons, regulating levers and binding posts are of brass, heavily nickel plated, and mounted on White Marble.

No. 470—Transformer only, (**no** instruments), in carrying case, with connecting cord and plug, for 110 volts, 60 cycle, alternating current; Code, **Aba.** Price ---$15.00

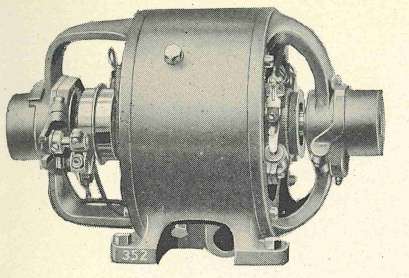


Figure No. 953

Rotary Converter

Where the Direct Current only is available, it is necessary to install a Rotary Converter to operate the Type "H5" Generator. Our Rotaries are designed to deliver the maximum efficiency when used as we recommend. The output of this Rotary, when operated on the 110 Volt line, is 77 Volts, and a Step-up Transformer is necessary to raise this voltage back to 110. When operating on the 220 Volt line, a Step-down Transformer is required.

No. 953—2500 Watt Fischer Rotary, for 110 D. C.; Code **Epact.** Price---$145.00
No. 958—2500 Watt Fischer Rotary, for 220 D. C.; Code **Erect.** Price---$145.00
No. 963—Step-up Transformer, for No. 953; Code **Epic.** Price ----------- 11.50
No. 968—Step-down Transformer, for No. 958; Code **Ester.** Price -------- 11.50

The Sign of Service

Fischer
CHICAGO, ILL.

The Davis Printing Co., Milton, Wis.

TYPE "H-5" COIL

Is guaranteed for a period of two years from date of purchase against Inherent defects.

Fischer
CHICAGO, ILL.